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EXAMINER

PADGETT, MARIANNE L

ART UNIT

PAPER NUMBER

1717

NOTIFICATION DATE

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | | | |
|------------------------------|--|---------------------------------------|--|
| Office Action Summary | Application No. 10/567,650 | Applicant(s) SCHERER ET AL. | |
| | Examiner MARIANNE L. PADGETT | Art Unit 1717 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/17/11 & 7/11/11.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1,3-9,18,19 and 21-25 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1,3-9,18,19 and 21-25 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

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1. A **Request for Continued Examination** under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/11/11 has been entered.

The examiner notes that the claims under examination relate to amendments made with the RCE on 7/11/11, plus amendments as set forth in the after final (after notice of appeal) submission of 6/17/11. It is noted that the amendment filed with the RCE corrects the ambiguity noted with respect to claims 9 & 18 in the advisory of 6/30/11. The after final amendment removed some new matter issues, but the one with respect to the refractive index range in claim 21 remains.

2. **Claims 6, 22-23 & 25** are rejected under 35 U.S.C. **112, second** paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 has been amended to require that "the substrate comprises a plastics material" (emphasis added), where *as written*, it appears that that material is required to contain plural plastics, however noting the support cited on page 4, lines 28-31, plus the paragraph proceeding that on lines 24-27 when a particular material is specified, it is a singular resin (e.g. CR-39), as it is in dependent **claim 22** where "the plastics layer comprises a resin" (emphasis added; contradictory disagreements between plural & singular), and the generic introduction in the preceding paragraph, while using the plural "plastics" was referring to a generic category, not necessarily use of multiple plastics in one layer. Therefore, it is unclear whether applicants actually intended to require plural plastics. Due to this ambiguity in possible interpretations &/or intents, either option will be considered, especially considering that "comprises" means that the substrate may contain any other material, as well as the singular or plural plastics that might be intended.

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New claims **24 & 25** are directed to limitations related to "antisoiling", which term is used but not defined on page 5, lines 20-25, however lacking definition in the specification or clarification on the record, this terminology may be considered relative, since what the layer has "antisoiling" properties or characteristics with respect to is not defined or disclosed by the specification, i.e. what the layer antisoiling with respect to is relative & undefined. Alternatively, this terminology may merely be considered extremely broad, and may be considered to encompass any material which is or has antisoiling properties with respect to some material, thus would be considered to encompass for example any material with hydrophobic properties that may repel potential contaminants or staining materials that are polar, or any material with lyophobic properties that repels some other fluid which may have or carry potentially soiling contaminants, etc.

New **claim 25** requires "the antireflection stack does not include a final antisoiling layer", however it is unclear whether this negative limitation means that there is merely not in antisoiling layer as part of the antireflection stack, or if no antisoiling layer may be deposited at some later time, as in on top of the antireflection stack, i.e. is the claim prohibiting the amorphous layer that has been deposited from having antisoiling properties" as it might or might not be considered part of the stack; or is it prohibiting any of the antireflection layers from having a property that might also be antisoiling to any degree, and if so how, much antisoiling properties must be excluded? Is this claim prohibiting use of any silicon dioxide layers that may have antisoiling properties? Clarification of scope is needed.

3. **Claims 6 & 22-23** are rejected under 35 U.S.C. **112, first** paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 6 has been amended to require that "the substrate **comprises** a plastics material" (emphasis added), which besides the lack of teaching in cited support of the particular plastic being plural plastics,

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the support found in the specification also did not indicate that the plastics (singular or plural) could be in mixture with unlimited & unspecified other materials, as indicated by "comprises". Therefore, this amendment *encompasses* **New Matter**, as it is broader than the support found in the *original* specification; i.e. the amended claim limitations encompass, but are not limited to, the support found in the original specification. Note that dependent claim 22 also employs "**comprises** a resin" (emphasis added) where the "comprises" is not supported by the original specification that states the "material may in particular be a resin such as CR-39..." which only indicates a singular material & in no way supports the "comprises" language.

Furthermore, **claim 6** as amended in reciting " substrate comprises a plastics layer", does not actually derive support from page 4, lines 24-31, as the disclosures therein are related to the substrate itself not a layer on the substrate or a layer of the substrate, reciting "... use of various substrate is, which may consist of mineral materials or more advantageously plastics materials. [¶] the material may in particular be a resin such as..., which may in certain cases be covered with an anti-abrasion varnish..."; therefore the support is for the substrate consisting of a resin, not just some layer that the substrate comprises being a resin. Hence in this respect, claim 6 further *encompasses* **New Matter**. It is noted that for purposes of examination, especially in light of what it is actually supported, while claim 6 has written includes options that are not disclosed, one may also considered that a lens to be a freestanding layer, thus a freestanding resin layer that is a lens may be considered to be encompassed by this new claim language, which is broader than the original disclosure.

The specification was re-reviewed for support for the deposited exterior layer of claim 1 specifically having the range of refractive indexes defined in **claim 21** of $n = 1.35-1.39$, regardless of wavelength applied. No support for this the claim limitation added in the 3/9/10 amendment was found, so it is continued to be considered **New Matter**. As previously discussed (section 2, first paragraph therein of the 12/9/10 rejection) , there were found three instances where the specification discusses

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specific refractive indexes with respect to an external layer **&/or** a specific fluorocarbon. The **first** disclosure directed to the exemplary PTFE film is *neither* generic, *nor* deposited by claim 1's technique (i.e. $n = 1.35$ at 630 nm provides no support); and the **second** disclosure is a *goal*, employing silica's refractive index as an upper limit to aim below, but lacks any direct or reasonably inferred connection to the results of the claimed process (i.e. no disclosure that this goal was achieved). While the **third** disclosure is a **single example** ($n = 1.39$ measured at 600 nm) for a particular exemplary deposition using a specific gas & specific parameters, thus these original disclosures cannot be said to support the claimed range (claim 21) added by the 3/9/2010 amendment. Applicant's apparent assertion (third paragraph of the 7/7/2010 remarks) that page 1, line 16-19's discussion of silica, that it would be beneficial to use a material with a lower refractive index, is entirely unconvincing of supporting a particular refractive index range that does not appear to be discussed in the specification, thus added refractive index range limitation must be considered to encompass **New Matter**. Note that while the specification supports depositing amorphous layers containing F & C deposited via supplying fluorocarbon ions via the exemplary process (pages 8-9), the refractive index disclosed as "of the order of 1.39 at 600 nm", is only relevant to measurement at that particular wavelength, thus does not provide broad support for the claimed refractive index without regard to the wavelength at which it was measured.

Applicant's brief statement in their 7/7/2010 remarks that "Page 1, lines 16-19 pertains to one of the purposes of the current invention which is coating a material having a refractive index lower than that of silica and thus the support of claim 21 can be found" is entirely unconvincing, as what lines 14-19 actually say is "In the field of antireflection coatings on ophthalmic lenses in particular, it is beneficial to use a material having a refractive index lower than that of silica ($n \sim 1.47$ at 630 nm), a material that is widely used at present, as this optimizes the efficiency of the antireflection coating...". This statement provides no range that can be in any way said to be applicable to applicants' claimed deposit, it is merely a statement of what is known in the art as generally desirable, and does not even include a either endpoint

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in the 1.35-1.39 range, plus again shows that the particular refractive index recited relates to a specific wavelength being applied, thus this citation is supportive of the examiner's position maintained above, that claim 21 encompasses mostly New Matter.

4. The following is a quotation of **35 U.S.C. 103(a)** which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. It is noted that the previously claimed possibility that the ophthalmic lens is actually deposited on the substrate, has been deleted & the independent claim now clearly recites that the substrate is an ophthalmic lens, hence removing ambiguity with respect to the original specification, plus removing the relevance of **Klemm et al.** (6,986,857 B2) to the claims as now written, thus this reference has been removed from the applied rejection

6. **Claims 1, 3-9, 18-19 & 21-25** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Veerasamy** (WO 01/36342 A2), in view of **Knapp et al.** (6,077,569), or vice versa, optionally further considering **Chien-Shing et al.** (EP 0 942 072 A2).

Applicants' amended independent claim of 7/11/11 no longer requires the refractive index characteristics of fluorocarbons be considered with respect to the deposited amorphous F+C layer,

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although dependent claim 21 recites the particular range of $n = 1.35-1.39$ (unsupported) for the amorphous F + C exterior layer on an antireflection stack of an ophthalmic lens, however the combination of external amorphous layer on such an antireflection stack has been previously considered with respect to **Veerasamy** (WO), in view of **Knapp et al.** (569) as repeated below, with further discussion relating issues, such as ophthalmic lenses, which are discussed in col. 1, lines 15-40+, col. 2, lines 53- 67+; col. 3, lines 20-36+, etc. in **Knapp et al.** (569).

The independent claim now clearly recites that the substrate is an ophthalmic lens, with new dependent claim limitations requiring "substrate comprises a plastics layer" (see above discussion support/scope issues), possibly further limited as "comprises a resin" (note ambiguous plural/singular relationships), over which an "anti-abrasion varnish" may have been applied. However, it is noted that the primary reference, **Veerasamy** (WO) teaches their process is relevant for application to glass or plastic substrates, particularly substantially transparent plastic or glass substrates that have plastic laminated thereon (page 8, figure 1 description; page 20, top half); while **Knapp et al.** (569) deposits overlapping compositions via analogous processes on substrates that may be various plastics, used for optical substrates such as lenses. **Knapp et al.**'s plastic substrates may also be coated with polymer layers (e.g. polysiloxane, acrylic or urethane polymer coatings applied by spin or dip coating processes), where the polymer layers improve the durability & abrasion resistance of the plastic substrate for handling purposes (col. 3, lines 24-32 & col. 8, line 58-col. 9, line 3). While **Knapp et al.** (569) does not employ the word "resin", nor "varnish", these terms are generic terminology, with "resin" considered consistent with specific plastic substrate materials taught to be employed in **Knapp et al.**, or the polymer layers deposited thereon (especially noting exemplary polymeric lenses being deposited on in Exs. B&C are CR-39 poly (allyl diglycolcarbonate), i.e. the same material as applicants teach as exemplary resin); & with "varnish" considered consistent with the applied polymer layer, as varnish encompasses a solution of resin in a volatile solvent, plus **Knapp et al.** teach applying the polymer coatings that supply abrasion

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resistant properties via a solution deposition techniques. Hence, it would have been obvious to one of ordinary skill in the art when employing substrates as suggested by Veerasamy, in view of Knapp et al., including the suggested abrasion resistant polymer coating, to apply suggested polymeric material (i.e. resins) in solution forms, including volatile solvents, as such solvents are conventionally employed for the taught spin or dip coating processes for purposes of adjusting viscosity in order to control coating application & film thicknesses, etc.

New claims to the amorphous layer having antisoiling property & the antireflection stack not including a final antisoiling layer have also been made in the 7/11/11 amendment, however the examiner notes that fluorocarbon compositions are generally known for their hydrophobic & antisoiling characteristics, thus any fluorocarbon deposit would reasonably have been expected to have such characteristics. Note that **Veerasamy** (WO), as set forth in their abstract or page 8, description of figure 1, are providing coating with hydrophobic properties, thus provide teachings considered to be consistent with possible meanings of the claimed "antisoiling property". Furthermore, when applying a top coating expected to have such antisoiling characteristics, it would've been economically wasteful to apply a preceding layer expected to have like characteristics, but not be exposed, i.e. unable to perform its supposed purpose, as it's going to be covered by the final layer. In other words, no competent practitioner in the art would apply an antisoiling layer that it's going to be covered up by another antisoiling layer, thus it would have been obvious to one of ordinary skill in the art, if depositing fluorocarbons on lenses as suggested by the above combination, to not apply an alternative antisoiling layer before its deposition, as a matter of competence in avoiding wasted efforts.

As previously noted, **Veerasamy** (WO) has discussions of refractive indexes of their deposited **fluorinated amorphous DLC coatings**, where page 32 discloses embodiments with refractive index of the relevant coatings being from about 1.4-2.0, with specific examples of refractive indexes in fluorinated coatings being 1.75 & 1.65 as measured at 543 nm, where the exemplary non-fluorinated DLC coatings

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had $n = 2.2$. The examiner notes that the three data points show a trend of increasing percentage of fluorination having decreased refractive index. Veerasamy (WO) further teaches that one may independently tune the refractive index to match desired optical properties. The examiner notes that $n \approx 1.4$ is insignificantly different than 1.39, as the former has only two significant figures, thus considering only two significant figures $1.39 \equiv 1.4$; hence while not explicitly teaching overlapping refractive indexes due to different significant figures & not providing a specific example having $n = 1.4$; it would've been obvious to one of ordinary skill in the art that "about 1.4" is reasonably inclusive of 1.39. It is also noted that $n = 1.39$ is the only claimed reflected index value found to be partly supported in applicants' specification for the claimed deposit, however this refractive index in applicants' specification was measured at 600 nm, while Veerasamy et al.'s values are measured at 543 nm. The PTO cannot determine or test how measurement at different wavelengths correspond, or how use of different wavelengths for measurement will affect the n values for any particular material in a reference or in applicants' specification. Also these teachings of Veerasamy (WO) would have reasonably suggested routine experimentation employed to produce any of the taught range of refractive indexes, inclusive of about 1.4, for the taught fluorinated DLC protective abrasion resistant coatings (page 39-40), which as discussed on pages 2, 6-7 (bridging ¶), page 20 & page 39 are intended to be used on glass or plastic substrates, including optical substrates (e.g. windows), where pages 9 & 16-17 additionally suggest depositing this taught layer over multilayer coating is inclusive of low-E or silicon oxide + silicon nitride coatings.

As previously set forth, Veerasamy ((WO): abstract; figures 1-3, 9-10 & 13; p. 1, 2nd ¶; p. 6, last ¶; p. 8, lines 21-24; p. 11-12, bridging ¶; p. 13, lines 1-5, 14-19 & 22; p. 16, lines 18-p. 17, line 12; p. 20, 2nd ¶-¶ bridging to p. 21; p. 25, line 6-end of page; p. 26, all; p. 27 first ¶; p. 28, line 3-p. 29, line 14; p. 31, line 3-p. 32, line 16, esp. p. 31, lines 15-17 & p. 32, lines 4-11; p. 36, sample #1) **teaches** deposition of a hydrophobic highly tetrahedral amorphous diamondlike carbon coating via a plasma ion beam, which

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may include **fluorine** to improve the hydrophobicity and compositions of ta-C:SiO:F, which as exemplified by sample No. 1 on page 36 may be 54.6 at.% C +1.2 at.% F, thus is "mostly" or containing F + C. *(Also, as noted above fluorinated DLC, also containing claimed elements may have refractive indexes in significantly different than specifically claimed values)*. The plasma apparatus as illustrated by figures 10 & 13, include ion beams that may be considered to be an "ion gun" & clearly accelerate ions, which as indicated on page 32 may come from CF₄ or CF₆ (e.g. C₂F₆?) gases, and as indicated on pages 25, 26, 28, etc., the gas composition for the plasma ion beam may also include oxygen &/or argon in the overall reagent mixture for depositing the DLC based coating. Substrates to be deposited on include glass or plastic, with mention of use on substantially transparent plastic, or for example on automotive windshields that are combination of glass substrates laminated to plastic substrates; and the taught DLC coatings that may include fluorine, may be deposited as a top protective coating over underlying "low-E" coating (13 US patents incorporated-by-reference to show exemplary coatings, with use of silicon oxide &/or silicon nitride underlying coatings specifically mentioned, page 17); where the resultant coated articles preferably have visible light transmission greater than 80% (page 20); & where the inclusion of F is taught to be employed to effect the refractive index in order to improve transmission. Note each layer in the multiple layers of different materials suggested by these teachings will have its own characteristic refractive index.

While the primary, **Veerasamy** (WO), is directed to deposition of amorphous C & F containing protective topcoats that may be employed on optical substrates, the primary reference has no discussion of stacked antireflective coatings *per se*, deposited via PVD techniques, however Knapp et al. ((569): abstract; figure; col. 1, line 34-col. 3, line 37 & 65-col. 4, line 16; col. 6, lines 25-56; col. 7, lines 34-47; col. 8, lines 15-37 & 53-65+; col. 11, esp. lines 35-45 & 52-65) teach that dielectric coatings are commonly applied to plastic & glass substrates to achieve a variety of optical effects, where antireflective coatings (AR coatings) are one of the most common typical optical coatings, employing a multilayer

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coating structure composed of alternating layers of dielectric materials with relatively high refractive indexes & relatively low refractive indexes. Knapp et al. particularly discussed deposition of multilayer AR coatings stacks on many different types of lenses including specifying **ophthalmic**, with the intent that highly abrasion resistant coating layers are formed by ion beam assisted deposition techniques, including a top or outerlayer of DLC that provides additional abrasion protection & reduced surface friction (summary; col. 5, lines 18-67+; col. 8, lines 15-52+; col. 13, line 52-col. 14, line 38, etc.). Knapp et al. (569) teach typical dielectric materials for such optical coatings, mentioning silica dioxide having $n=1.46$, zirconium oxide with $n=2.05$ & DLC with controllable refractive index between 1.7-2.2, where all are useful in an AR coating stack. In discussing exemplary abrasion resistant antireflection coating on lenses, Knapp et al. teach depositing a first coating on one or both sides of the lens, followed by deposition of a composite dielectric coating consisting of multiple layers of dielectric materials with at least two different indexes of refraction (col. 13, lines 55-62), which configuration inherently requires at least one index of refraction to be higher than the other. These teachings, in combination with teaching of common AR coatings in the background, noting alternating layers of relatively high, then relatively low dielectric material, the final (e.g. top protective) layer being relatively low, including specific mention of Zr oxide & Si oxide materials (col. 1, lines 34-col. 2, line 8), would reasonably have suggested to one of ordinary skill in the art antireflection stacks configured as claimed. Given these teachings & considerations, claimed AR stack order would have been further obvious considering teaching on upper layer properties as found on col. 14, lines 12-37, which include the layer before the top layer being a high refractive index layer, with the top layer being a DLC layer having excellent durability & weatherability, with specific mention of **hydrophobic** nature, hardness, low friction coefficient, abrasion resistance & cleanability (i.e. antisoiling).

As previously noted, Knapp et al. further teach that is known to employ DLC deposited via direct ion beam deposition processes as top protective coatings on such AR stacks, where the prior art

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deposits AR coatings via various **PVD techniques**, such as **electron beam evaporation** or ion beam assisted **electron beam evaporation**, etc. (col. 12, lines 34-48, esp. 35-37; col. 13, line 8-col. 14, line 38, esp. col. 13, lines 8-16), but where improvement is still needed, especially with respect to plastic substrates for the deposition these coatings in order to provide a highly durable & abrasion resistant antireflective coatings on various optical substrates. Knapp et al. is teaching various abrasion resistant coatings & composite coatings deposited via plasma ion beam techniques using reactive precursor compositions & high vacuum, including topcoats of amorphous DLC, having high hardness, low friction coefficients, transparency across a majority of the electromagnetic spectrum & chemical inertness, where the DLC may also be doped with other atoms, mentioning N & Si. Knapp et al. notes that while evaporation & sputtering sources are not shown in their figure 1 plasma ion beam apparatus schematic, that such sources can be readily integrated therein (col. 8, lines 53-57).

It would have been obvious to one of ordinary skill in the art, given the teachings of Knapp et al. with respect to the desirability of DLC coatings as protective coatings having hydrophobic natures, hardness, abrasion resistance, etc., for optical substrates inclusive of ophthalmic lenses with AR coatings, to employ such AR coatings deposited by conventional PVD techniques on the optical substrates inclusive of ophthalmic lenses as alternatively suggested in Knapp et al., then employing the analogous DLC coatings of Veerasamy, specifically the taught protective amorphous DLC & F containing coatings, as Knapp et al. shows both the expected effectiveness & desirability of the AR coatings with analogous DLC protective coatings, plus the desirability of properties of hydrophobicity, hardness, abrasion resistance are taught to be desirable by Knapp et al., while Veerasamy (WO) further teaches that employing fluorine in the analogous protective DLC top coatings on optical substrates enables one to control the refractive index (data suggested that increased fluorine percentage lowers refractive index), which one of ordinary skill the art would reasonably have been expected to find desirable to control given the teachings of Knapp et al. for when coating of ophthalmic lenses, where the top protective coating is

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known to be desirably a relatively lower refractive index material as well as protective. It is further noted that Veerasamy may be considered to further show expected effectiveness of employing fluorinated DLC, as their various DLC coatings applied to similar compositions that are also optical substrates may or may not contain fluorine, thus providing compositions overlapping with those of Knapp et al. (569).

With respect to Knapp et al. (569) teachings of dielectric layer deposition relevant to the AR coatings, while the alternatives inclusive of the electron beam evaporation processes are silent with respect to specific pressures to be employed, they are specified to be vacuum deposition processes. Also, the specifically exemplified ion-assisted plasma deposition processes of dielectric materials are also performed under vacuum, with examples such as Ex. A, starting on col. 14 & applied to polycarbonate disks, provides an initial evacuation to a pressure less than 5×10^{-3} Torr, with further deposition processing having pressures maintained at 5×10^{-2} Torr or 1×10^{-1} Torr, all of which pressures are significantly less than the claimed maximum pressure endpoint of 10^{-2} Pa (e.g. ≤ 0.75 Torr). It would have been obvious to one of ordinary skill in the vacuum deposition art to employ typical vacuum processing pressures for any of the suggested alternative vacuum deposition processes, all of which may be considered physical vapor deposition processes, where the above teachings reasonably would suggest to one of ordinary skill in the art to employ typical pressures used therefore dependent on the particular technique, which typical pressures would reasonably have been expected to have been less than the relatively high vacuum pressure claimed by applicants as a maximum endpoint for their extremely broad claimed pressure range. Furthermore, one of ordinary skill would reasonably have been expected to employ routine experimentation dependent on the particular apparatus & particular reagents being employed in a particular vapor deposition process, where considering exemplary pressures used in analogous layer deposition in Knapp et al., would reasonably have suggested useful pressure regimes in which to commence such routine experimentation at pressures significantly below the claimed maximum endpoint.

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Optionally, **Chien-Shing et al.** (who has teachings analogous to Veerasamy (WO)), provide cumulative reasons why the inclusion of fluorine in the DLC coating would reasonably have been expected to provide desirable & superior results, because the Chien-Shing et al. teachings suggest that inclusion of fluorine provides better adhesion due to reduce stress, thus providing further motivation to employ fluorine as dopant atoms in the DLC structure, in order to provide improved adhesion, which Knapp et al. also notes is needed & desirable.

As previously discussed, **Chien-Shing et al.** (abstract; col. 2, line 54; [0012-14], esp. col. 4, lines 41-44; [0015], esp. col. 5, lines 25-27; [0027-28], esp. col. 6, line 54-col. 7, lines 11 & 17-20; [0030]; [0034-36], esp. col. 9, lines 25-35; and claims, esp. 1, 3 & 5) teach ion beam deposition of fluorinated diamondlike carbon (FDLC), which may be amorphous, via an ion beam deposition process that employs high vacuum conditions (e.g. $10^{-4} \sim 10^{-5}$ Torr) may employ single or plural ion sources of C & F or gaseous halocarbon or solid fluoropolymer source materials may be employed, noting that previously mentioned ([0008]) fluorocarbon sources include CF_4 , C_2F_6 & C_4F_8 , give a context to the taught gaseous halocarbon that may supply both C & F. It is also taught that inert gas ions such as Ar^+ or Kr^+ may be employed during the ion beam deposition in order to assist in attaining desired sp^3 structure, where [0028] discusses the inert gas ions as supplied from a separate ion source, however the claims are inclusive of claimed inert gas (e.g. rare gas) ions plus C & F ions all coming from a single source, thus the reference may be consistent with applicants' feeding at least one rare gas to the ion gun in the mix containing F & C; or as this combination is not explicitly set forth in the body of Chien-Shing et al's specification, given the claims & teachings, specifying single ion source, with the specific reason for employing inert gas ions, plus the general knowledge of one of ordinary skill in the art that inert gas is conventionally & typically employed as a carrier gas for vaporized material, such as taught halocarbon (e.g.

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fluorocarbons), it would have been obvious to one of ordinary skill in the art to employ inert gas as part of the gaseous mixture, when using the taught single ion source, as such is consistent with the overall teachings therein, with reasonable expectation of producing taught results.

Chien-Shing et al. also teach that as their deposition techniques for FDLC layers produces relatively low stress, this low stress improves the adhesion to substrates, such as silicon, silicon dioxide, Al, TiN, & glass, by reducing the tendency of the layer to delaminate from the substrates (e.g. increases adhesion), with increasing F concentration tending to decrease stress, thereby improving the adhesion with respect to films with more stress. This teaching concerning relative improved or increased adhesion has relevance broadly to deposition on substrates required to be abrasion resistant, where one of ordinary skill in the art would further notice that materials listed therein to which adhesion is improved are generally old & well known to be relevant to antireflection films.

7. **Klemm et al.** (col. 1, lines 15-35), remains of interest for teachings that lenses are commonly provided with several coatings to impart the finished lens with additional or improved optical or mechanical properties, inclusive of scratch resistant coatings, anti-reflecting coatings & a hydrophobic topcoat. It was noted that Klemm et al. has further relevant teachings with respect to known & desirable anti-reflecting coatings, such as set forth on col. 6, lines 27-65, which discuss a preference for the anti-reflecting coating be in a multilayer film comprised of three or more dielectric materials of alternating high & low refractive indexes, where these materials include silicon oxide is & zirconium dioxide. Klemm et al. also suggests that the antireflective coatings be applied by vacuum deposition techniques, inclusive of evaporation techniques or alternatively plasma assisted vapor phase chemical deposition, hence is analogous to the AR coating teachings of Knapp et al. (569). Thus cumulative to the above rejection, it would've been further obvious to use antireflection stacks configured as claimed, including with overlying protective hydrophobic coatings, as such are further suggested by the teachings of Klemm et al. with respect to appropriate antireflection coatings for ophthalmic lenses, & especially considering a

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preferred minimum number of multilayers is taught to be three anti-reflecting coating, and they include claimed alternating materials of silicon dioxide & zirconium dioxide, thus there are only two possible orders for alternating such low & high refractive index materials, where either order would reasonably have been obvious to one of ordinary skill given these specific teachings or the combined teachings with respect to refractive indexes of Klemm et al. & Knapp et al.

8. New art of interest includes: **Kimock et al.** (5,190,807), **Takatani et al.** ((5,841,584): col. 4, lines 45-50 & col. 5, lines 1-8; EBVD of silica & titania with pressures at 1.4×10^{-4} Torr); & **Phillips** ((6,545,809 B1): col. 6, lines 21-67 & col. 10, lines 42-47; EBVD of silicon oxides with pressures of 2×10^{-4} Torr) have further teachings of interest with respect to PVD processes for depositing dielectric layers of interest, including typical pressures used therefore, which are further supported of the above discussed obviousness.

Other art of interests previously cited included: **Finley et al.** ((2003/0221481 A1), [0027-36], etc.), with further teachings of interest with respect to optical substrates, refractive index coatings & employing physical deposition techniques; **Scherer et al.** (WO 02/11195 A1), published 2-2002 by the present inventors, where the abstract indicates employing beams of ions from polyfluorocarbon compounds & rare gas for deposition of low-index antiglare films onto silicon oxide films, with figure 1 depicting essentially the same apparatus as presently employed & which is also inputting oxygen gas, however lacking a translation further relevance cannot be readily determined; **Veerasamy et al.** (5,858,477) incorporated-by-reference in Veerasamy (WO) discussed above for various alternative ion beam apparatus useful for depositing highly tetrahedral amorphous carbon & **Hartig et al.** (5,376,455) also incorporated-by-reference in Veerasamy (WO) for examples of useful multilayer "Low-E" optical coatings.

9. Applicant's arguments filed 6/17/11 & 7/11/11, discussed above, have been fully considered but they are not persuasive.

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10. **Any inquiry** concerning this communication or earlier communications from the examiner should be directed to **Marianne L. Padgett** whose telephone number is **(571) 272-1425**. The examiner can normally be reached on M-F from about 9:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan, can be reached at (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marianne L. Padgett/
Primary Examiner, Art Unit 1717

MLP/dictation software

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